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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,229	10/24/2005	Ali Chaouche	052488	9062

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EXAMINER	
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ART UNIT	PAPER NUMBER
3748	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/532,229	CHAOUCHE ET AL.	
	Examiner	Art Unit	
	Diem Tran	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,5 and 7-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5 and 7-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to an amendment filed on 6/29/07. In this amendment, claim 1 has been amended and claims 3, 6 have been canceled. Overall, claims 1, 2, 4, 5, 7-19 are pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 4, 7, 8, 12, 13, 15, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tashiro et al. (US Patent 6,901,747) in view of Buratti (US Patent 6,491,016).

Regarding claims 1, 19, Tashiro discloses a system for assisting regeneration of a storage/release NOx trap integrated in an exhaust line of a motor vehicle diesel engine, the system comprising:

gas admission means for admitting gas into the engine, means for injecting fuel into the cylinders thereof in the form of at least pilot and main injections, and means for controlling said gas admission for periodically switching the engine between a lean mixture standard operating mode in which NOx is stored in the trap and a rich mixture regeneration operating mode, in which NOx is released from the trap and the trap is regenerated, wherein in a rich-mixture regeneration operating modes the injection means are suitable for implementing at least one pilot

injection triggered in a crankshaft angle range from approximately 50° to approximately 5° ahead of the top dead centre point of the cylinder concerned (see col. 8, lines 32-40, col. 9, lines 28-35)(see Figure 5A, col. 8, lines 45-48); wherein controlling the fuel injection means in accordance with the standard and regeneration modes of operation for engine loads below a predetermined threshold value (i.e. idling operation) (see col. 19, lines 55-64); however, fails to disclose that at least two pilot injections triggered in a crankshaft angle range from approximately 50° to approximately 5° ahead of the top dead centre point of the cylinder concerned and the main injection is triggered in an undercalibrated range up to a crankshaft angle of approximately 35° after the top dead center point. Buratti teaches that at least two pilot injections triggered in a crankshaft angle range from approximately 50° to approximately 5° ahead of the top dead centre point of the cylinder concerned and the main injection is triggered in an undercalibrated range up to a crankshaft angle of approximately 35° after the top dead center point (see Figure 2, col. 3, lines 10-14, 45-47, 54-56).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Buretti in the Tashiro system, since the use thereof would have improved the vehicle drivability by reducing engine noises.

Regarding claim 2, Tashiro further discloses that the control means are adapted to control the gas admission means to reduce the quantity of gas admitted into the engine when said engine is in its regeneration mode of operation (see col. 14, lines 28-34, col. 20, lines 56-65).

Regarding claims 4, 8, the modified Tashiro system discloses all the claimed limitations as discussed in claims 1, 2 above, however, fails to specifically disclose that the predetermined load threshold value is defined by a brake mean effective pressure of approximately 3 bars.

Brake mean effective pressure (P) is recognized as a result effective variable, that is P of a higher or lower value is an indication of a high or low load, respectively.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided any specific brake mean effective pressure correlation with the predetermined load threshold value, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering an optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 7, 12, 13, 15, the modified Tashiro system discloses all the claimed limitations as discussed in claims 1, 2, 4, 8 above, however, fails to specifically disclose operating the engine with a lean mixture for approximately 60 seconds and with a rich mixture for approximately 2 seconds.

It is well known for one having ordinary skill in the art, to realize that the engine is operated between a lean operating mode to store NOx in the trap and a rich period to release NOx from the trap. Lean period and rich period are recognized as a result effective variable, that is lean time of a long period of time is associated with a less lean air fuel ratio, whereas lean time of a short period of time is due to more lean air fuel ratio. For rich time, a short rich time is associated with a richer air fuel ratio, whereas a long rich time is due to a less rich air fuel ratio. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided any specific lean period and rich period for approximately 60 seconds and 2 seconds, respectively, based on desired air fuel ratios of the engine, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering an optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claims 5, 9-11, 14, 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tashiro et al. (US Patent 6,901,747) in view of Buratti et al. as applied to claims 1, 2, 4, 8 above, in view of Digeser et al. (US Patent 6,082,325).

Regarding claims 5, 9-11, the modified Tashiro system discloses all the claimed limitations as discussed in claims 1, 2, 4, 8 above; however, fails to disclose regulating the operation of the recirculation means during operation of the engine with a rich mixture. Digeser teaches regulating the operation of the exhaust gas recirculation during operation of the engine with a rich mixture (see col. 1, lines 41-60, col. 9, lines 14-22).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Digeser in the modified Tashiro system, since the use thereof would have been conventional in the art to control the composition of the air admitted into the engine to assist the regeneration of the NOx trap.

Regarding claims 14, 16-18, the modified Tashiro system discloses all the claimed limitations as discussed in claims 5, 9-11 above, however, fails to specifically disclose operating the engine with a lean mixture for approximately 60 seconds and with a rich mixture for approximately 2 seconds.

It is well known for one having ordinary skill in the art, to realize that the engine is operated between a lean operating mode to store NOx in the trap and a rich period to release NOx from the trap. Lean period and rich period are recognized as a result effective variable, that is lean time of a long period of time is associated with a less lean air fuel ratio, whereas lean time of a short period of time is due to more lean air fuel ratio. For rich time, a short rich time is

associated with a richer air fuel ratio, whereas a long rich time is due to a less rich air fuel ratio. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided any specific lean period and rich period for approximately 60 seconds and 2 seconds, respectively, based on desired air fuel ratios of the engine, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering an optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Response to Arguments

Applicant's remarks filed on 6/29/07 have been fully considered but they are not deemed persuasive in part; however, a new non-final rejection is set forth above.

Conclusion

Any inquiry concerning this communication from the examiner should be directed to Examiner Diem Tran whose telephone number is (571) 272-4866. The examiner can normally be reached on Monday -Friday from 8:30 a.m.- 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (571) 272-4859. The fax number for this group is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 800-786-9199 (toll-free).

Diem Tran
Patent Examiner

THOMAS DENION
SUPERVISORY PATENT EXAMINER
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